

FACT SHEET



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Fluoride in Private Drinking Water Wells

Fluoride occurs naturally in groundwater because it is a component of several different minerals in soil and bedrock. The amount of fluoride we consume is important because the benefits of low levels of exposure are outweighed by adverse effects at high levels. Dietary fluoride, in the right amount, promotes the development of strong permanent teeth. For this reason, fluoride is considered most beneficial for children less than 12 years of age. However, too much fluoride can cause teeth to discolor and weaken; a condition dentists call “dental fluorosis”. Fluoride can also affect bone development. The National Academy of Sciences most recent report on fluoride (March, 2006) stated that the existing drinking water standard from USEPA (4 milligrams per liter; a.k.a., mg/L or ppm) is too high. In general, levels in drinking water should be kept to 1 ppm or less to avoid overdose. This is especially the case because of other important sources of fluoride; including, toothpaste, mouth rinses, fluoride drops, and tea. The extent to which fluoride in Connecticut groundwater contributes too the incidence of dental fluorosis is likely low in most cases. However, because fluoride concentrations in Connecticut groundwater have not been extensively surveyed, it is possible that localized areas of high fluoride exist. Fluoride has no smell or taste. Testing is therefore the only way to confirm that your well water does not contain excessive amounts of fluoride. You should let your dentist know the results of your fluoride well test. If your well water has fluoride levels near 1 ppm, your children will likely not need fluoride supplements to promote dental health.

Some useful information on fluoride and fluoride testing is included below. For more information, call the Environmental And Occupational Health Section of the Connecticut Department of Health (860-509-7742).

WHAT ARE THE BENEFICIAL EFFECTS OF FLUORIDE?

Fluoride has been shown to prevent tooth decay. This relationship was “discovered” in the early part of the 20th century when it was observed that residents of certain areas of U.S.A. developed brown stains on their teeth. These stained teeth, though unsightly, were highly resistant to dental decay. In the 1930's it was discovered that the prevalence and

severity of this type of mottled enamel was directly related to the amount of fluoride in the water.

WHAT ARE THE ADVERSE EFFECTS OF FLUORIDE?

Too much fluoride can cause a disease called “fluorosis”. At high levels of exposure, the beneficial effects on tooth structure are negated, and the tooth actually becomes weaker. At still higher exposures, the skeletal system is affected, and chronic exposure can be crippling. Skeletal fluorosis is usually restricted to tropical and subtropical regions, and is frequently exacerbated by factors such as calcium deficiency or malnutrition. Fluorosis is widely prevalent in regions of China, India, Middle East, and Africa. The high incidence of fluorosis in India is due to the fact that large areas of the country contain water supplies with some of the highest known levels of fluoride in the world.

HOW CAN I BE EXPOSED TO FLUORIDE?

Individuals can be exposed to fluoride through a wide variety of foods, drinks, and dental care products. Some foods, such as tea and seafood, have high levels of fluoride. Bottled water or beverages can contain fluoride from public water. Mineral water may also have high levels. In the case of natural waters, the variation in the fluoride content from region to region is dependent upon such factors as the source of water, type of geological formation and the amount of rainfall. (Dry regions tend to have higher fluoride.) Surface waters generally have low fluoride while ground waters typically contain more. Certain dental care products have fluoride added, and your dentist can advise you on which formulation may be beneficial to you or your child.

WHAT AMOUNT OF FLUORIDE IS OPTIMAL?

The estimated range of safe and beneficial intake of fluorides *from all sources* for adults is 1.5 to 4.0 milligrams per day (mg/day), and less for children and those with renal disease. In contrast, the daily intake of fluoride in regions where fluorosis is most prevalent varies from 10 to 35 milligrams per day (mg/day) and can be even higher in summer months. The World Health Organization’s guideline value for fluoride in drinking water is 1.5 mg/l. Above 1.5 mg/l mottling of teeth may occur to an objectionable degree. Concentrations between 3 and 6 mg/l may cause skeletal fluorosis. Continued consumption of water with fluoride levels in excess of 10 mg/l can result in crippling fluorosis.

WHAT SHOULD I DO IF MY WELL WATER CONTAINS TOO MUCH FLUORIDE?

If fluoride is present above 1.5 mg/l you should consult your dentist for advice on developing a plan to optimize fluoride intake. This is especially important if you have young children. The simplest and most reliable plan may be to purchase bottled water. Be sure that the bottled water is low in fluoride, as some products may contain more fluoride than your well water. Other “point of use” treatment options include installing a reverse osmosis or distillation system. For more information on these systems, see the relevant fact sheets in this series.

Regardless of the quality of the equipment purchased, it will not perform satisfactorily unless maintained according to the manufacturer’s recommendations. For more information, refer to the fact sheet: *Questions to ask when Purchasing Water Treatment Equipment*.